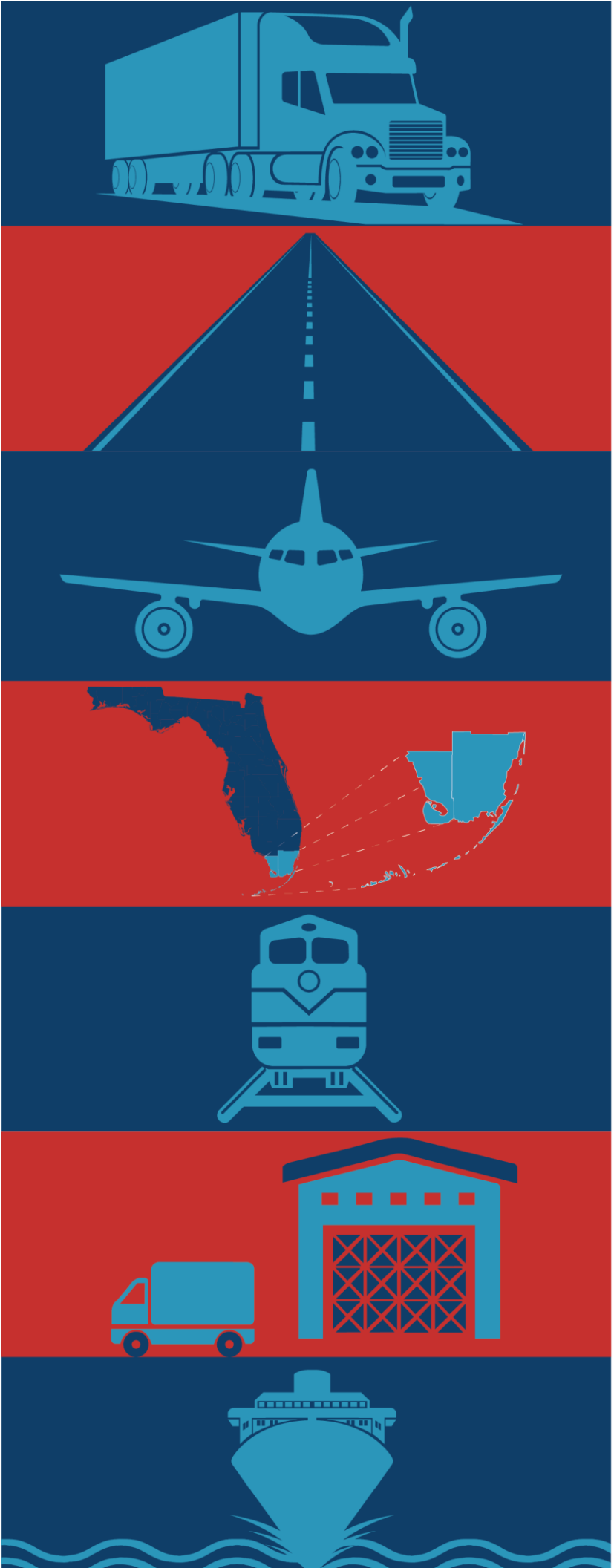

District Six

Miami-Dade Countywide Freight Improvement Plan

Freight Network Performance Overview

FPID: 437957-1-12-01

July 2024

FDOT

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Abbreviations List

Abbreviation	Complete Name/Phrase	Abbreviation	Complete Name/Phrase
AADT	Annual Average Daily Traffic	**LOS**	Level of Service
AM	Morning	**LRTP**	Long Range Transportation Plan
BEBR	Bureau of Economic and Business Research	**MD**	Mid-Day
BTS	Bureau of Transportation Statistics	**MIA**	Miami International Airport
CBP	Customs and Border Protection	**MPO**	Metropolitan Planning Organization
CDMP	Comprehensive Development Master Plan	**NHFN**	National Highway Freight Network
CRFC	Critical Rural Freight Corridor	**NHS**	National Highway System
CUFC	Critical Urban Freight Corridor	**NPMRDS**	National Performance Management Research Data Set
EA	Early Morning	**PHFS**	Primary Highway Freight System
EV	Evening	**PM**	Afternoon
FAF	Freight Analysis Framework	**SERPM**	Southeast Regional Planning Model
FDOT	Florida Department of Transportation	**SIS**	Strategic Intermodal System
FEC	Florida East Coast	**TAZ**	Traffic Analysis Zone
FTO	Florida Traffic Online	**TPO**	Transportation Planning Organization
FTP	Florida Transportation Plan	**TSA**	Transportation Security Administration
FTZ	Foreign-Trade Zone	**USDA**	U.S. Department of Agriculture
GAR	General Aviation Reliever	**USFWS**	U.S. Fish and Wildlife Service
HEFT	Homestead Extension of Florida's Turnpike		

1.0 Introduction

The *Miami-Dade Countywide Freight Improvement Plan*, an initiative by the Florida Department of Transportation (FDOT) District Six, is intended to enhance freight and logistics capacity, improve economic competitiveness through a more efficient transportation network, and provide a prioritized project bank for future infrastructure improvements to achieve these ends.

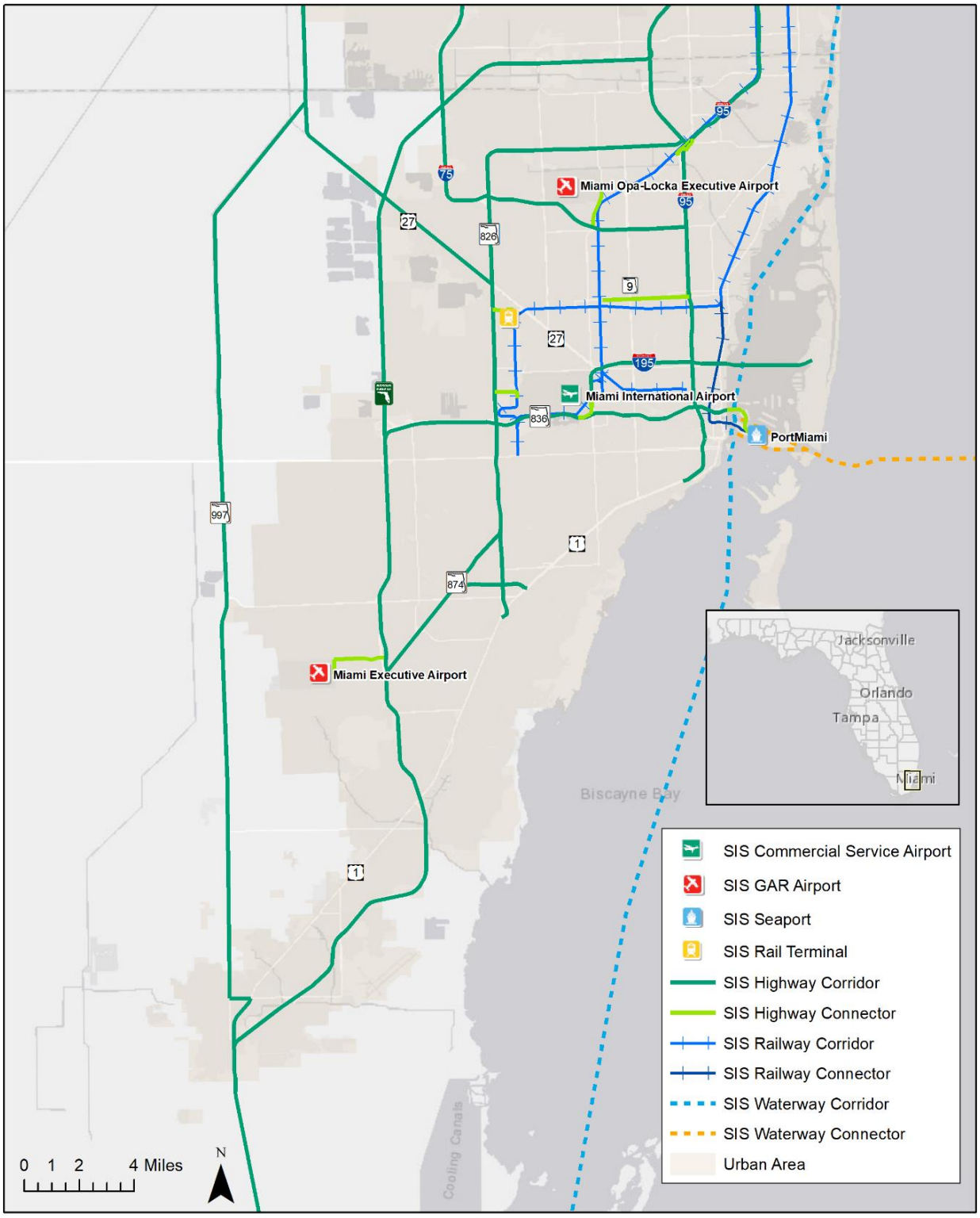
This *Freight Network Performance Overview* technical memorandum provides a system-level overview of the physical, operational, and performance components of the freight and logistics network following the completion of the data collection inventory of the existing and future conditions of the freight-related transportation infrastructure network in District Six. This technical memorandum documents the performance overview and presents the freight network statistics in terms of trends and forecasts for truck volumes and percentages, traffic level of service (LOS), truck speeds, commodities, demographics, and land use under this task.

2.0 Miami-Dade Freight Transportation System Overview

The freight transportation system plays a significant role in all major modes of transportation of Miami-Dade County, serving as a crucial gateway for commerce between the Americas and the rest of the world. The comprehensive freight system comprises networks involving airports, seaports, railways, waterways, roadways, and connectors. Most of these modes have been designated as part of the Florida Strategic Intermodal System (SIS). Established by the Governor and Legislature in 2003, the SIS in Florida is a top-tier network of transportation facilities crucial for the State's economic vitality and mobility. Designed to optimize the allocation of limited transportation resources, the SIS prioritizes key facilities that substantially impact interregional, interstate, and international travel. It serves as the primary target for transportation capacity investments, aligning with the implementation of the Florida Transportation Plan (FTP) – the State's extensive and forward-looking transportation vision and policy plan. The existing SIS integrates diverse elements for freight demands, encompassing highways, rail terminals, commercial airports, seaports, and waterways. **Figure 1** shows SIS facilities as part of the freight system in Miami-Dade County. The designated SIS facilities within District Six include:

- **SIS Commercial Service Airport**: Miami International Airport (MIA)
- **SIS General Aviation Reliever (GAR) Airport**: Miami Opa-Locka Executive Airport, Miami Executive Airport
- **Seaport**: PortMiami
- **Railways**: Florida East Coast (FEC) Railway, CSX Railway
- **Freight Terminal**: Miami Hialeah FEC Intermodal Terminal
- **Waterway**: Miami River
- **Roadways**: SIS highway corridors
- **Connectors**: Railway, waterway, and roadway connectors designated to provide access to SIS corridors

Figure 1. Miami-Dade County SIS Facilities



Source: FDOT Systems Implementation Office (September 2023)

2.1 Miami-Dade Freight Highway Network

Trucking Supply Chain Corridors

Most of District Six's corridors overlap the National Highway Freight Network (NHFN) and the SIS. For this performance overview, the combination of these two systems within Miami-Dade County was considered a Freight Network in this study. The Miami-Dade Freight Highway Network, critical to the South Florida supply chain, primarily encompasses the NHFN and the SIS within District Six. This network forms the backbone of our study on freight performance, leveraging these key corridors that facilitate the movement of goods throughout the region.

The NHFN includes the following subsystems of roadways:

- **Primary Highway Freight System (PHFS)**: The PHFS comprises key highway segments identified as vital for the U.S. freight transportation system. This designation is based on objective, measurable data, highlighting these routes as critical for the efficient movement of goods.
- **Other Interstate portions not on the PHFS (non-PHFS)**: The non-PHFS Interstate routes encompass the segments of the Interstate network that are not included in the PHFS. Despite not being part of the PHFS, these roadways are vital as they ensure comprehensive network connectivity and support access to key freight facilities.
- **Critical Rural Freight Corridors (CRFCs)**: CRFCs are designated in rural areas based on their importance to moving goods in regions less urbanized than major metropolitan areas. There are no CRFCs in Miami-Dade County.
- **Critical Urban Freight Corridors (CUFCs)**: CUFCs are identified within urban areas and are essential for efficient freight movement within cities and densely populated regions. There are no CUFCs in Miami-Dade County.

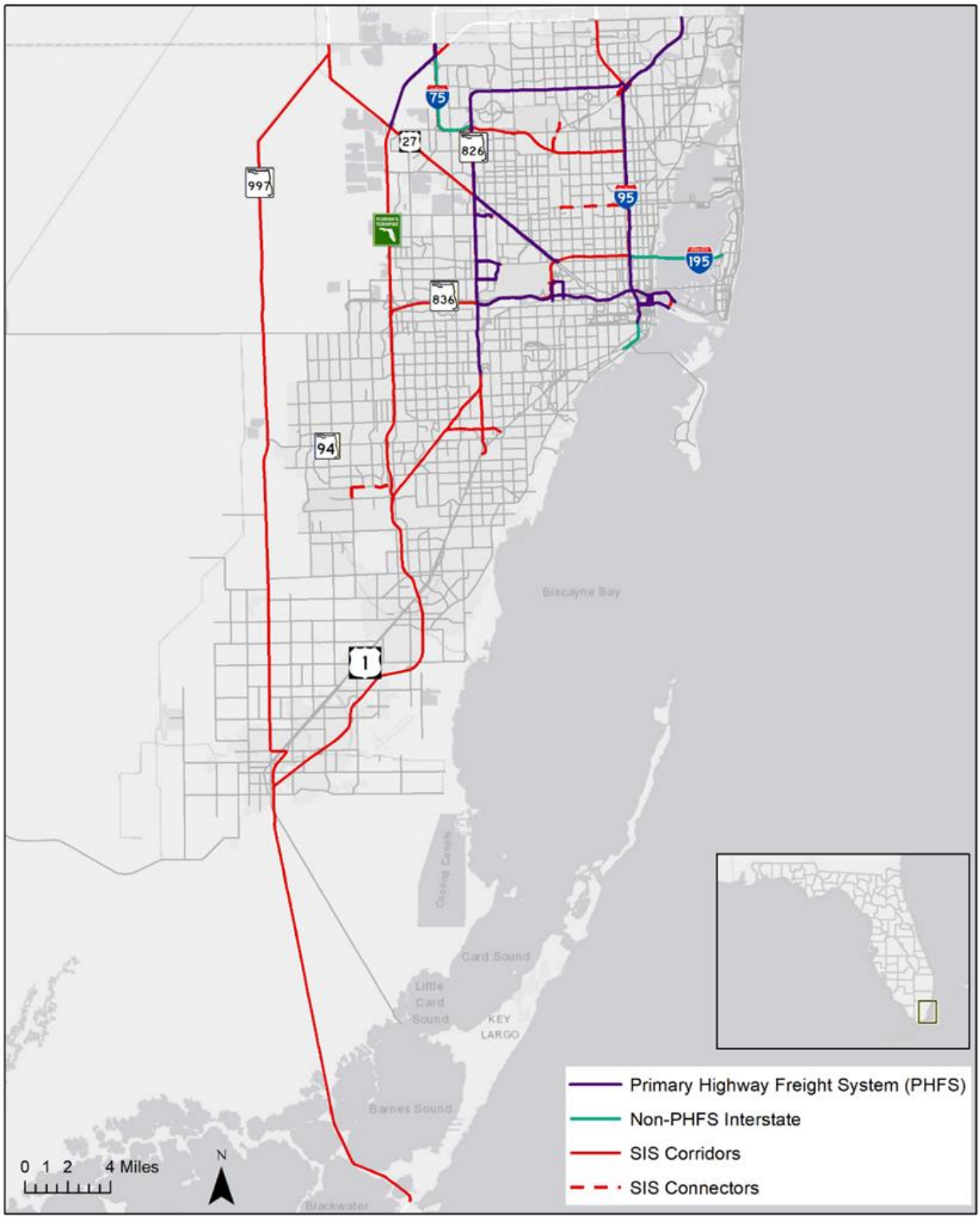
Given the proprietary data limitations, the focus of this memorandum shifted to utilizing available data sources to outline this freight network. Exploring the complexities of freight movement within a region often encounters obstacles due to the unavailability of detailed, specific data, which is frequently proprietary and kept confidential. This situation directs reliance on publicly available data and industry-wide trends to form an understanding. The absence of detailed data restricts the depth of analysis possible, suggesting that more focused data collection efforts could provide a deeper insight into the specifics of how goods are transported by rail, air, and sea in future analyses.

The designation of the NHFN is significant because it is an important requirement for funding programs. There are 72.3 miles for NHFN in Miami-Dade County, comprising 61.39 miles of PHFS, including I-95, I-395, SR-821, SR-826, SR-836, and 10.91 miles of non-PHFS, including I-75, I-95, and I-195.

Highway corridors play a vital role in the SIS. They carry the highest volume of people and freight and receive the most significant portion of funding from state and federal sources for capacity projects. It is the State's highest priority for transportation capacity investments and a primary focus for implementing the FTP, the State's long-range transportation vision and policy plan. The total mileage of the SIS highway corridors in District Six is 198 miles. The freight infrastructure generators include MIA, PortMiami, and the Miami River.

Figure 2 shows the NHFN and SIS Highway corridors/connectors in District Six. US-27 from SR-826 to SR-112 is not a SIS facility; however, it was recently added to the NHFN as a PHFS. SR-997, south of US-27, is designated as a SIS corridor but not in NHFN.

Figure 2. Miami-Dade Freight Network



Source: FDOT, Systems Implementation Office (September 2023)

Railroad Supply Chain Corridors

Access to detailed and specific data about railroad transportation is limited, as much of this information is not publicly available. This leads to a general overview based on available information, which may not provide detailed insights into volumes and routes that could be achieved with fuller data access. This section outlines the general trends and operational characteristics of the NHFN and SIS railroad systems, recognizing that more specific details might enhance understanding.

Air Cargo Supply Chain

Detailed information on air cargo logistics, such as cargo volumes and transportation routes, often remains proprietary and inaccessible for broader analyses. This results in an overview focusing on broader trends and operational characteristics within these sectors, providing a foundational understanding rather than an in-depth exploration.

Waterborne Supply Chain

In Miami-Dade County, the waterborne supply chain thrives as a cornerstone of the local economy, anchored by the PortMiami. Supported by robust infrastructure and a network of logistics providers, the County's waterborne supply chain plays a pivotal role in facilitating international trade, serving as a vital conduit for imports and exports. Miami-Dade's waterborne supply chain's resilience and efficiency contribute to economic growth, future expansion, and innovation.

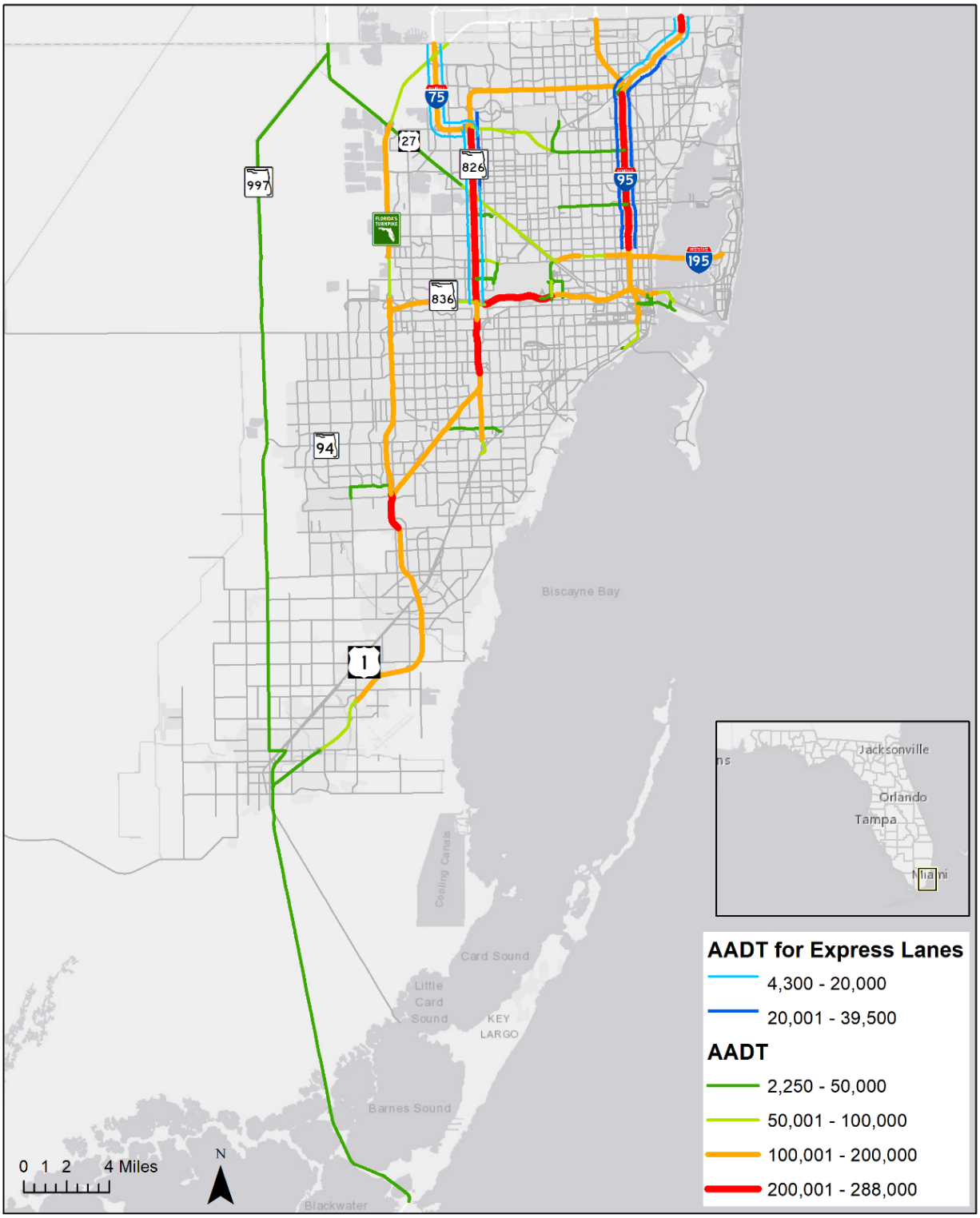
3.0 Freight Network Statistics

3.1 Annual Average Daily Traffic

Annual Average Daily Traffic (AADT) is the total volume of vehicle traffic on a roadway segment for one year divided by the number of days in the year. AADT is used for capacity and LOS analysis.[1] **Figure 3** presents the 2022 AADT of the Freight Network (NHFN and SIS Highway facilities) in Miami-Dade County. The figure highlights significant traffic volumes on key routes, including I-95, SR-826, SR-836, I-195, I-75, and the Homestead Extension of Florida's Turnpike (HEFT). The highest AADT volume is on I-95, south of NW 62nd Street, which was 288,000 in 2022. SR-997/Krome Avenue and US-27, components of the SIS facilities, show low traffic volumes primarily consisting of trucks.

[1] The AADT was obtained from the 2022 Florida Traffic Online webpage: https://tdaappsprod.dot.state.fl.us/fto/

Figure 3. AADT for Miami-Dade Freight Network (2022)



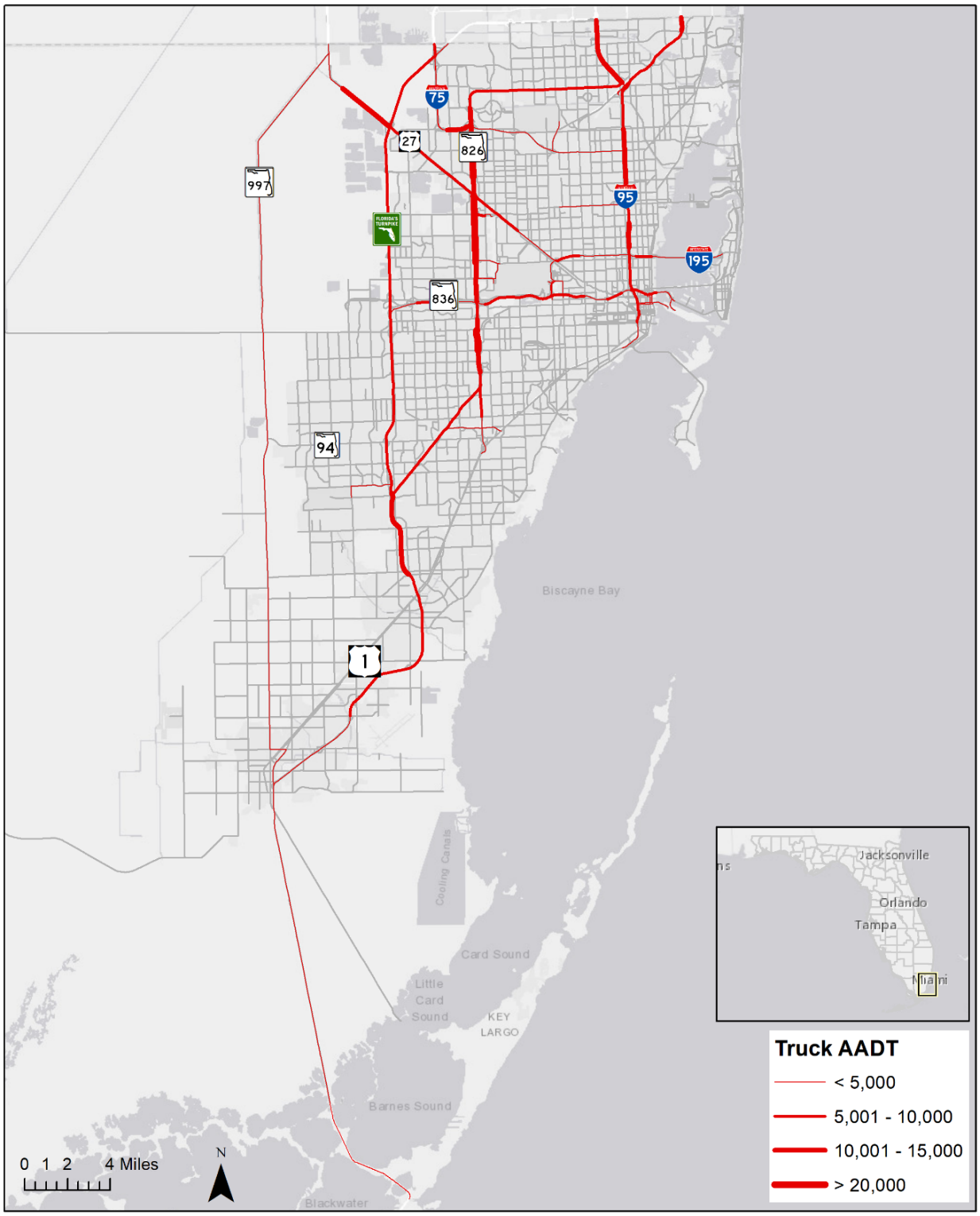
Source: FDOT (September 2023)

3.2 Truck Volumes and Percentages

Truck AADT is the annual average daily truck volumes on a roadway for one year, divided by the number of days in the year. Truck percentage is the number of trucks divided by the total number of vehicles in one day. Truck AADT and Truck percentage from 2022 obtained from FDOT's Florida Traffic Online (FTO) database were reviewed for the freight network. As shown in **Figure 4**, SR-826 carried the highest volume of truck traffic, which is over 20,000 trucks per day. I-95, I-75, and US-27 north of Turnpike carried over 10,000 trucks daily.

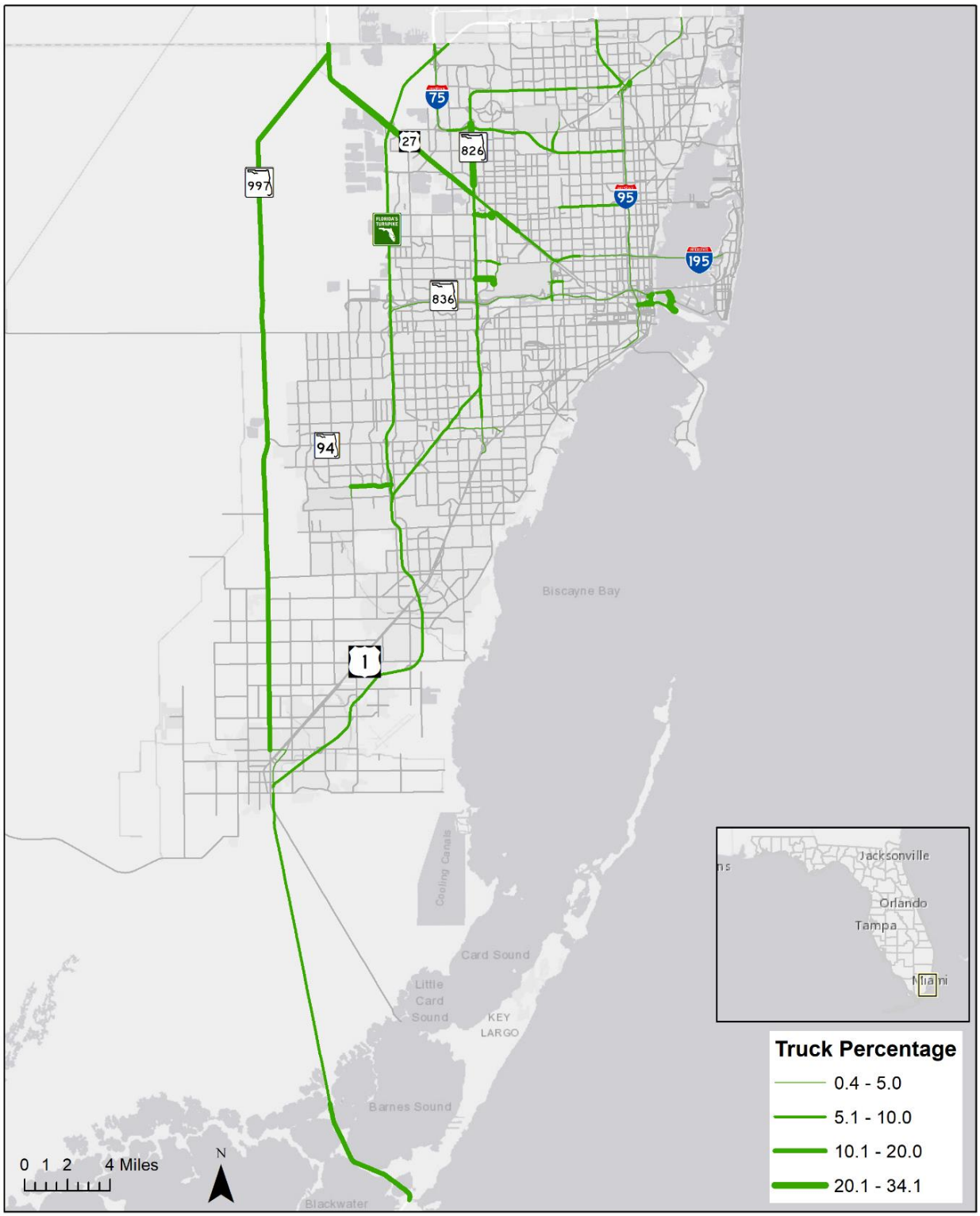
Figure 5 shows the truck percentage of the daily traffic. The truck percentage is higher than 10 percent for the entire corridor of SR-997. The truck percentage is about 20-30 percent for SR-826 north of US-27 and for US-27 north of Turnpike. The truck percentage for traffic along connectors to Miami International Airport, Port Miami, and Miami Hialeah FEC Intermodal Terminal is also high (20–30 percent).

Figure 4. Truck AADT for Miami-Dade Freight Network (2022)



Source: FDOT, Transportation and Data Analytics Office (September 2023)

Figure 5. Truck Percentage for Miami-Dade Freight Network (2022)



Source: Florida Department of Transportation (September 2023)

3.3 Train Volumes

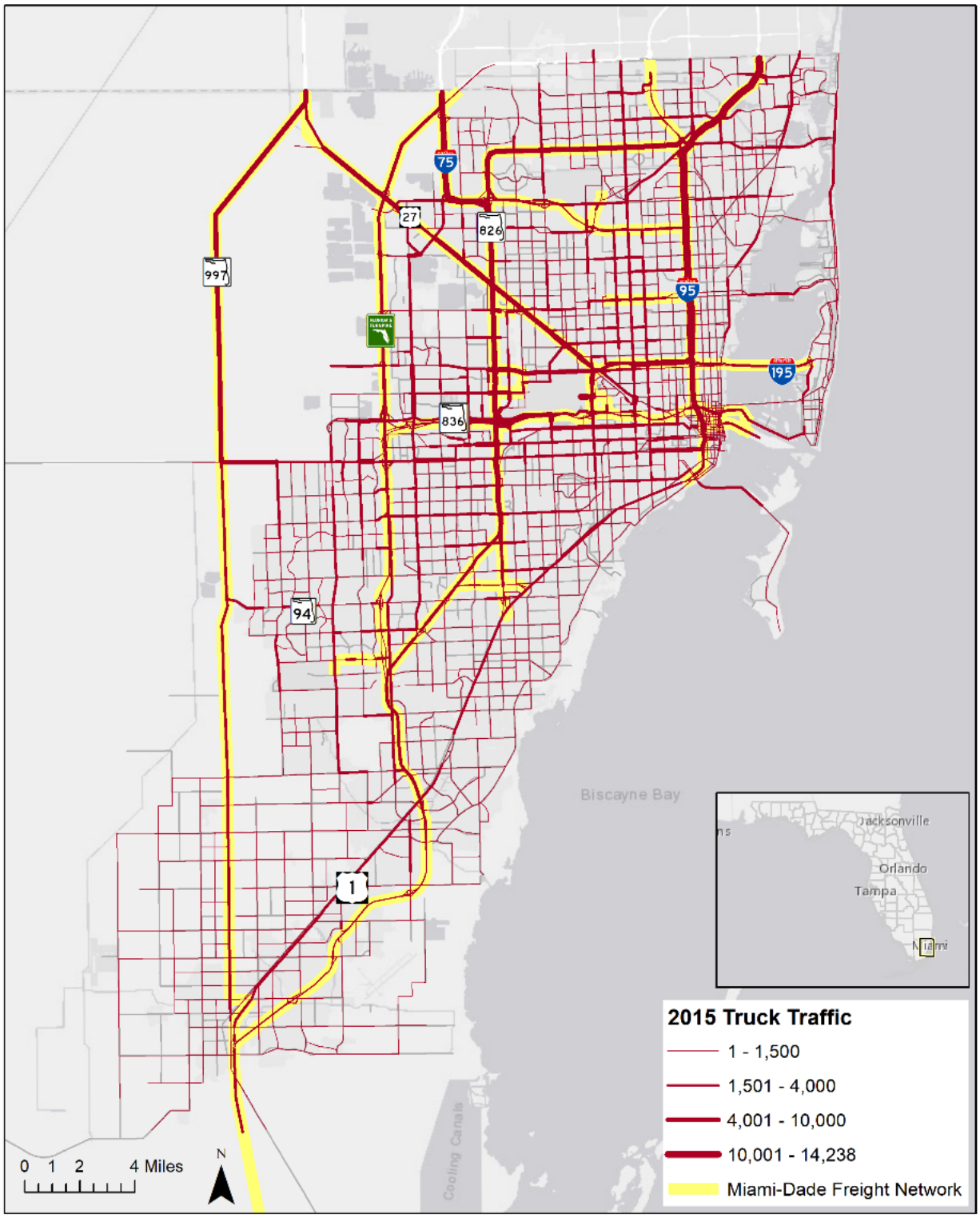
The freight train volumes on FEC and CSX railways are not publicly available due to security concerns.

3.4 Trend for Truck Volume and Truck Percentage

To understand truck travel patterns in the future year 2045, the loaded model networks for the base year 2015 and future year 2045 were gathered from the latest Southeast Regional Planning Model (SERPM), Version 8.533. SERPM 8 is the travel demand model calibrated to a 2015 base year and 2045 forecast year for southeast Florida, covering Palm Beach, Broward, and Miami-Dade counties. The SERPM 2045 model is based on the adopted Cost Feasible plans in the 2045 Long Range Transportation Plans (LRTP) for the Palm Beach Transportation Planning Agency (TPA), the Broward Metropolitan Planning Organization (MPO), and the Miami Dade Transportation Planning Organization (TPO) in South Florida. The loaded networks contain truck traffic volumes by direction for multiple periods of the day.

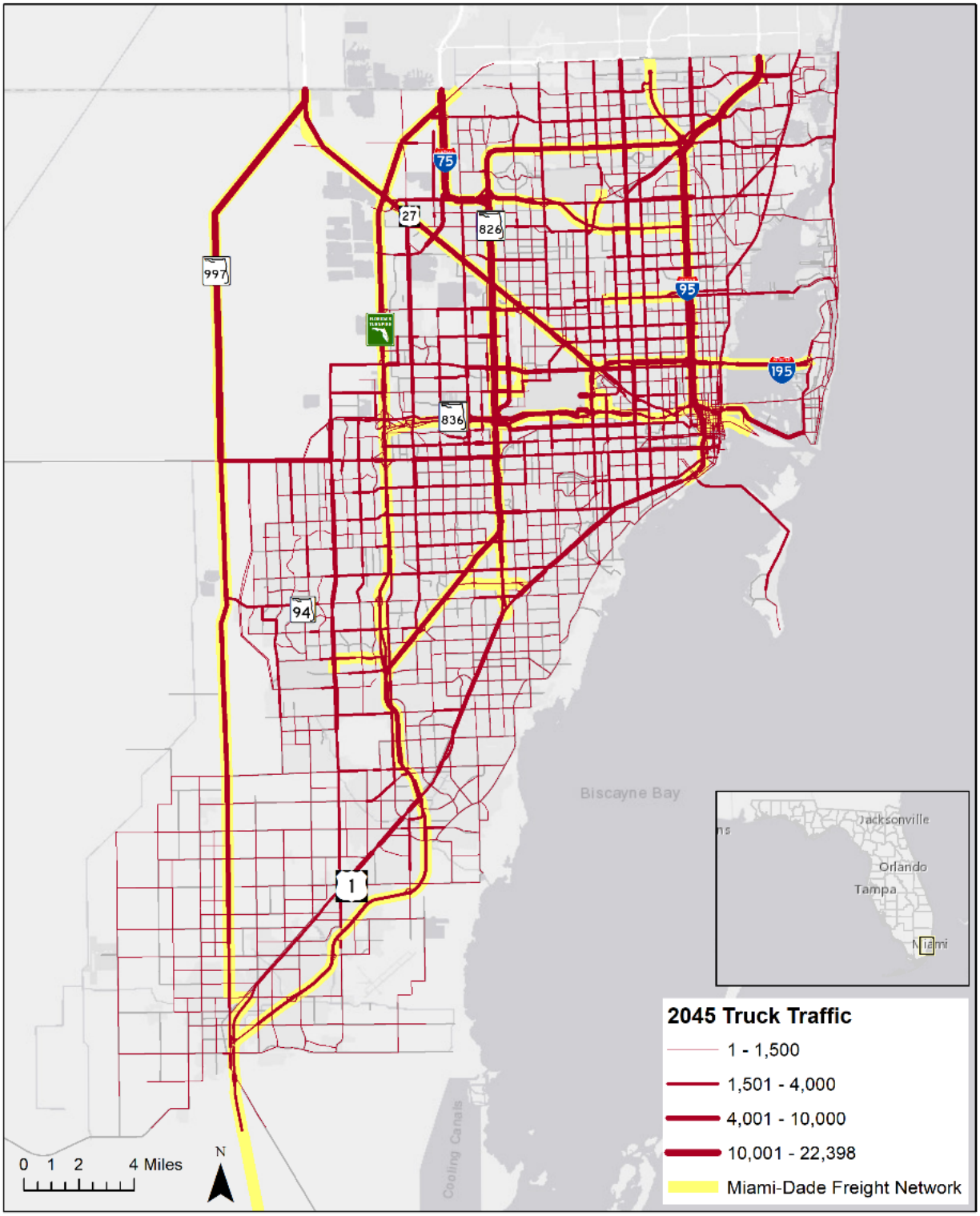
Figure 6 and **Figure 7** show the daily truck volumes for 2015 and 2045. The freight network's truck traffic on both maps appears high (highlighted in yellow).

Figure 6. SERPM Model Truck Traffic for the Year 2015



Source: FDOT, Freight and Rail Office (September 2023)

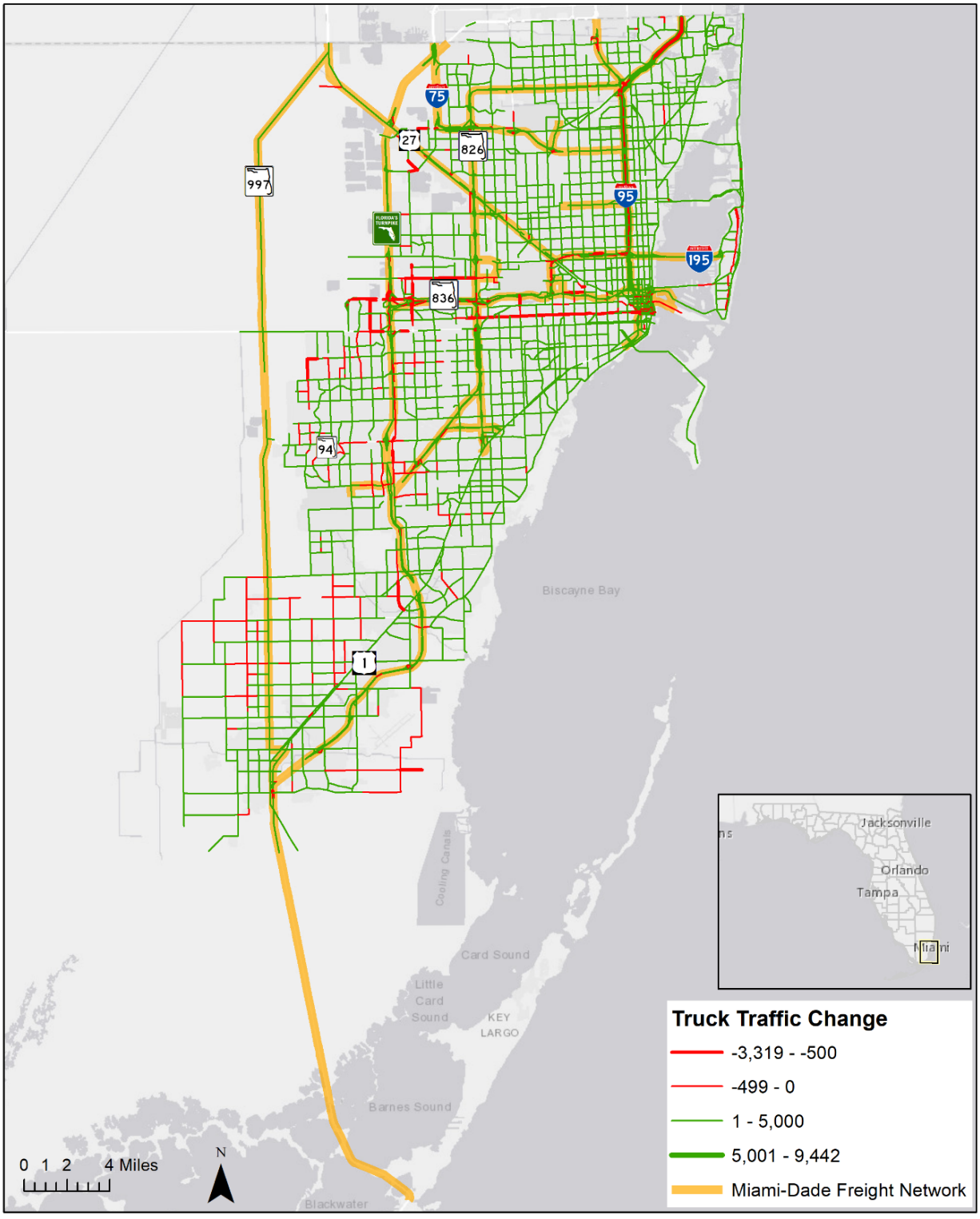
Figure 7. SERPM Model Truck Traffic for the Year 2045



Source: FDOT, Freight and Rail Office (September 2023)

Figure 8 shows the comparison of truck traffic between the years 2015 and 2045. The truck volume increases on most of the network segments. The highest growth occurs along I-95, I-195, and Turnpike in Miami-Dade County. The truck volume along these corridors increases by over 5,000 vehicles per day.

Figure 8. Truck Traffic Change from 2015 to 2045

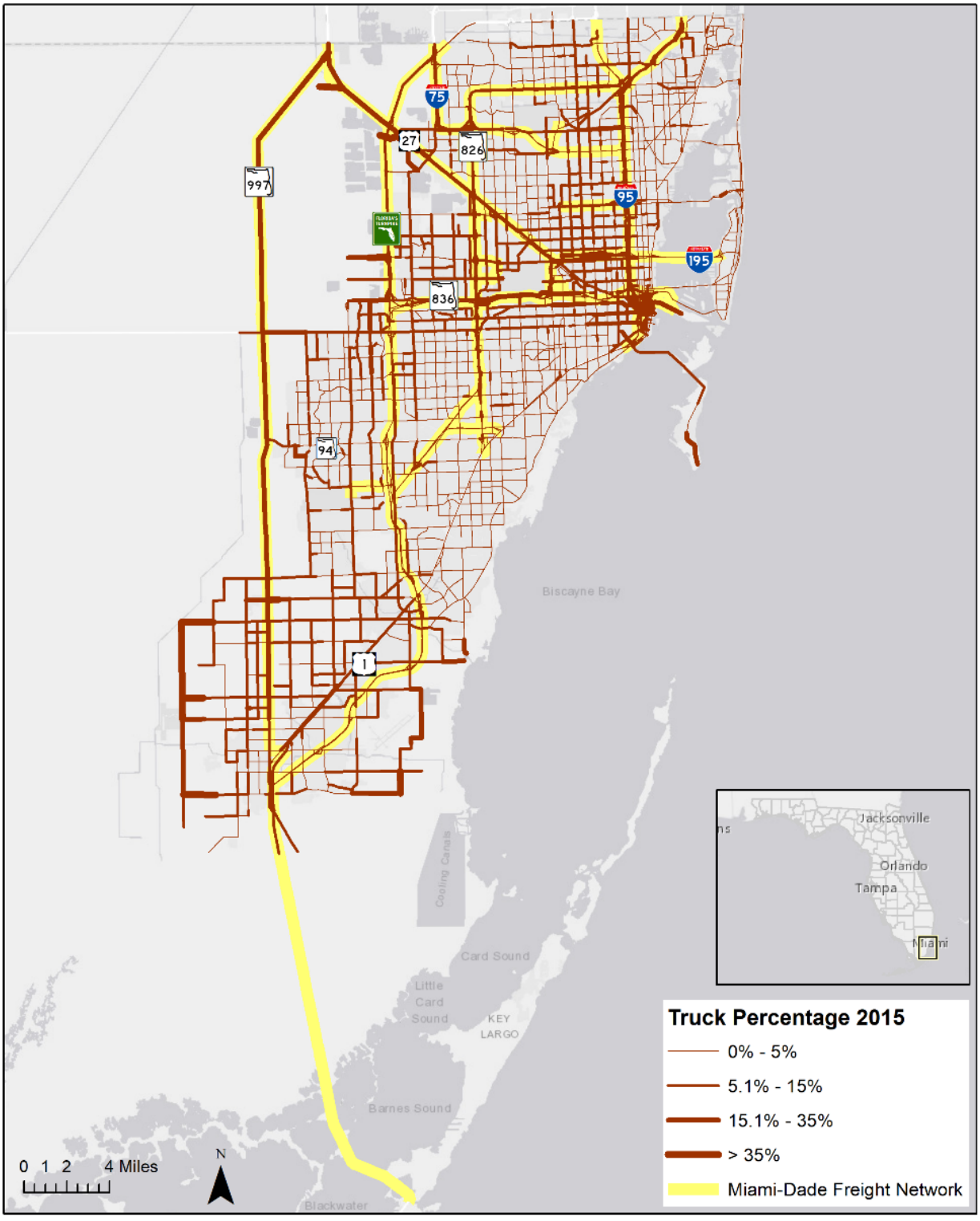


Source: FDOT, Transportation Data and Analytics Office (September 2023)

Figure 9 and **Figure 10** show the daily truck percentage for the years 2015 and 2045, respectively. The freight network's truck percentage on both maps appears high (highlighted in yellow).

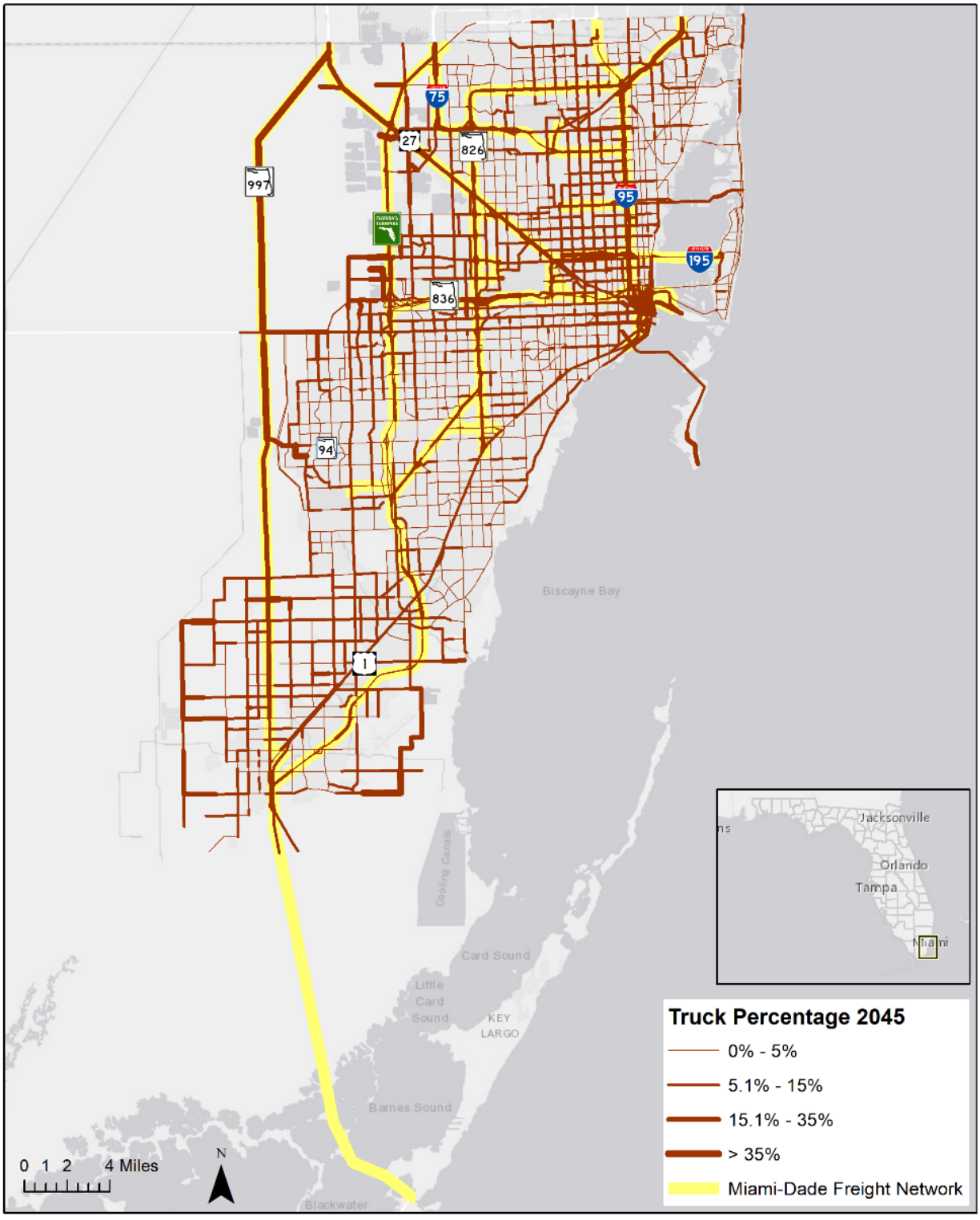
The truck percentages were then compared between the years 2015 and 2045 in **Figure 11** — the truck percentage changes by less than 5 percent for most roadway segments. The truck percentage is projected to increase by 6 percent (from 34 to 40 percent) along SR-997 north of SW 8th Street. For SR-826 in the City of Hialeah, the truck percentage will increase from 7-8 percent to 13-16 percent.

Figure 9. SERPM Model Truck Percentage for the Year 2015



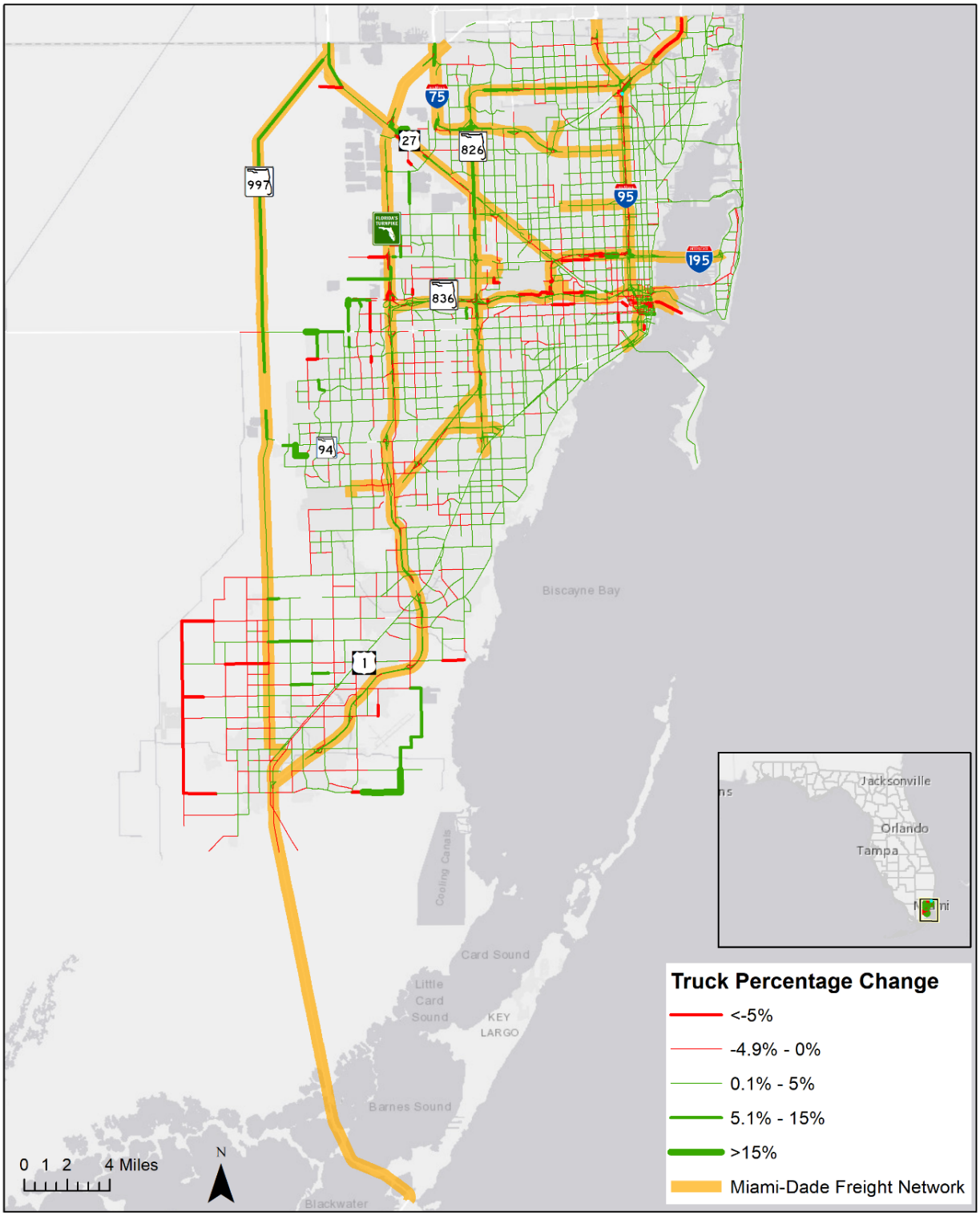
Source: FDOT, Freight and Rail Office (September 2023)

Figure 10. SERPM Model Truck Percentage for the Year 2045



Source: FDOT, Freight and Rail Office (September 2023)

Figure 11. Truck Percentage Change from Year 2015 to Year 2045

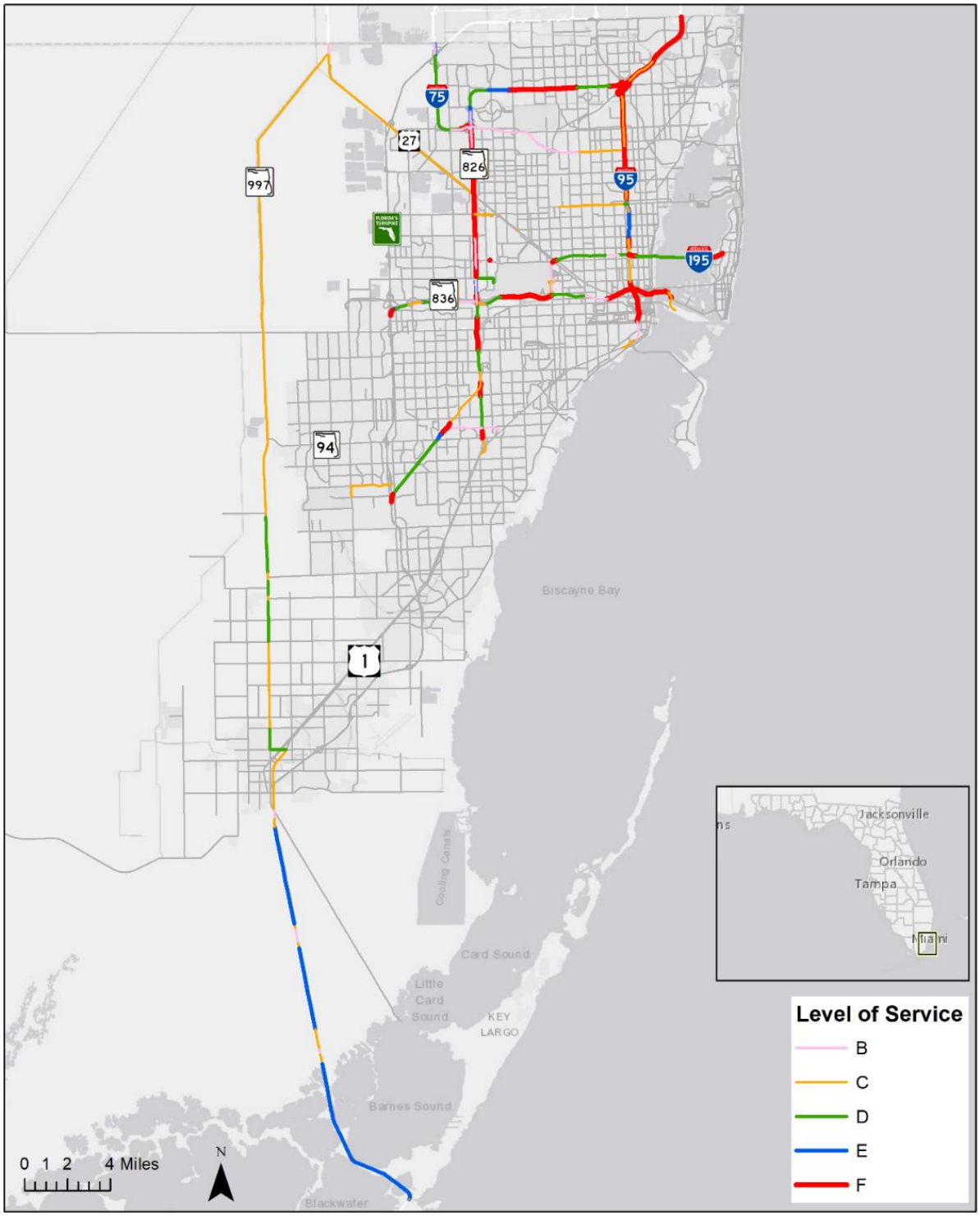


Source: FDOT, Freight and Rail Office (September 2023)

3.5 Traffic Level of Service

LOS is used to qualitatively describe the operating conditions of the roadway based on factors such as speed, traffic density, travel time, and delay time. **Figure 12** illustrates the LOS for state roads based on the 2022 AADT within Miami-Dade County. The analysis indicates that no state road segments show LOS A in Miami-Dade County. SR-826 and I-95 experience severe congestion and extensive delays due to high traffic volumes. In general, the NHFN roadways demonstrate poor service across the region. Conversely, SR-997 shows better LOS due to lower traffic volumes.

Figure 12. LOS for Miami-Dade Freight Network

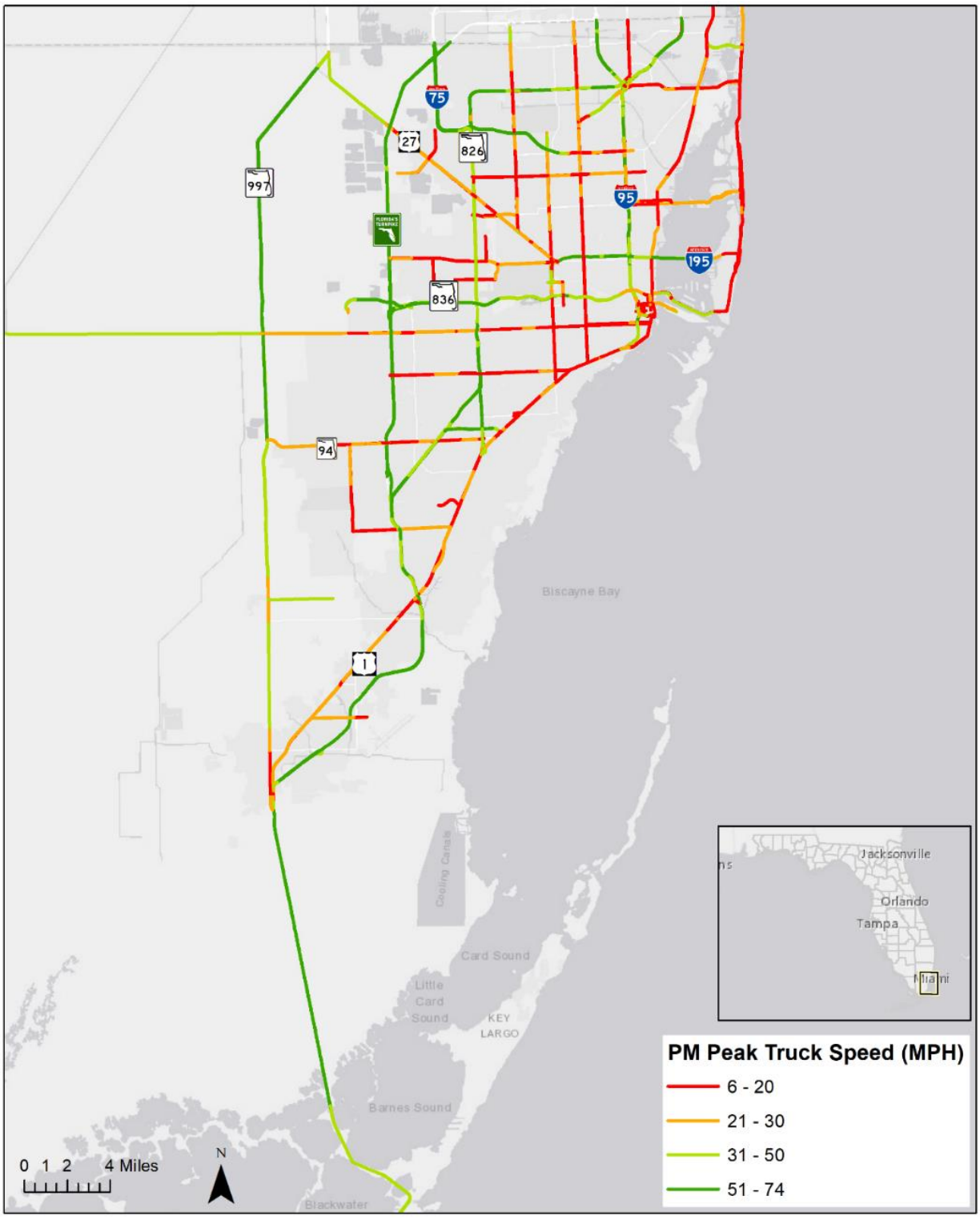


Source: FDOT (September 2023)

3.6 Speed Data for Truck Traffic

Speed measures how fast goods or people move along the roadway. Speed is also used in the LOS analysis. Speed data for truck traffic and all traffic in Miami-Dade and Monroe counties was obtained from the National Performance Management Research Data Set (NPMRDS) and INRIX (trucks and passenger vehicles) data separately. The speed data was assembled from probe vehicles and devices traveling on the National Highway System (NHS). The speed, historical average speed, reference speed, travel time (reported in seconds), and data density were downloaded for Jan 01, 2023, through Dec 31, 2023, and averaged by hour. The speed data was then compiled into the five (5) model time periods, including early morning from 22:00 to 6:00 (EA), morning from 6:00 to 9:00 (AM), mid-day from 9:00 to 15:00 (MD), afternoon from 15:00 to 19:00 (PM), and evening from 19:00 to 22:00 (EV) to evaluate the truck traffic conditions. During afternoon peak hours, truck traffic exhibits the lowest speed of the day for most roadway segments. **Figure 13** shows the average speed for truck traffic during the PM peak period.

Figure 13. Average PM Peak Period Speed for Truck Traffic



Source: FDOT, Transportation Data and Analytics Office (September 2023)

3.7 Summary of Key Freight Trends

In Miami Dade County, the existing AADT is high on the freight roadway network. The AADT volumes are over 100,100 on the freeways inside the PHFS, non-PHFS, and SIS Corridors such as I-95, I-75, SR-826, SR-836, and HEFT. The truck volumes on the freight roadways are over 4,000 vehicles per day. As a result, the LOS is over the FDOT LOS D target on I-95, HEFT, SR-826, and SR-836. Traffic congestion occurs on the roadways on the freight roadway network. The truck volumes on the freight network appear to be high. The truck percentages range from 1" to '0 percent on SR-997, SR-826, and HEFT. The 2045 traffic demand model of SERPM version 8.533 shows that the freight network's truck volumes will increase on most of the freight roadway network. The truck volumes along I-95, I-195, and HEFT will increase by over 5,000 vehicles per day.

4.0 Commodity Volume Trends and Forecasts

Understanding commodity flows in terms of tonnage for a region is necessary, as it directly reflects the demand for transportation capacity. **Table 1** presents a comprehensive overview of outbound commodity categories, their respective freight tonnage for 2020, the predicted tonnage for 2050, and the growth rate in Miami-Dade County. Within these categories, minerals and waste stand out as the primary contributors to the overall tonnage of the region, significantly surpassing other commodity types in terms of quantity. The substantial tonnage of minerals can be attributed to phosphate mining operations and continuous construction activities. Waste, consisting of municipal solid waste, construction debris, and other materials, is influenced by factors such as the high population density, the tourism industry, and commercial activities in the County.

Table 1. Projected Growth of Outbound Commodity Tonnage in Miami-Dade County (2020-2050)

Commodity Name	2020	2050	Growth
Minerals	2,943,000	3,424,000	16.3%
Waste	2,938,000	3,196,000	8.8%
Paper	1,582,350	2,333,700	47.5%
Other durable manufacturing	1,558,286	2,334,600	49.8%
Agricultural products	1,383,800	1,553,200	12.2%
Coal	1,363,300	1,507,725	10.6%
Nondurable manufacturing	1,241,350	1,846,325	48.7%
Petroleum products	943,475	953,600	1.1%
Chemicals	935,250	1,244,575	33.1%
Lumber	626,800	930,750	48.5%
Clay and stone	38,175	22,825	-40.2%
Total	15,553,786	19,347,300	24.4%

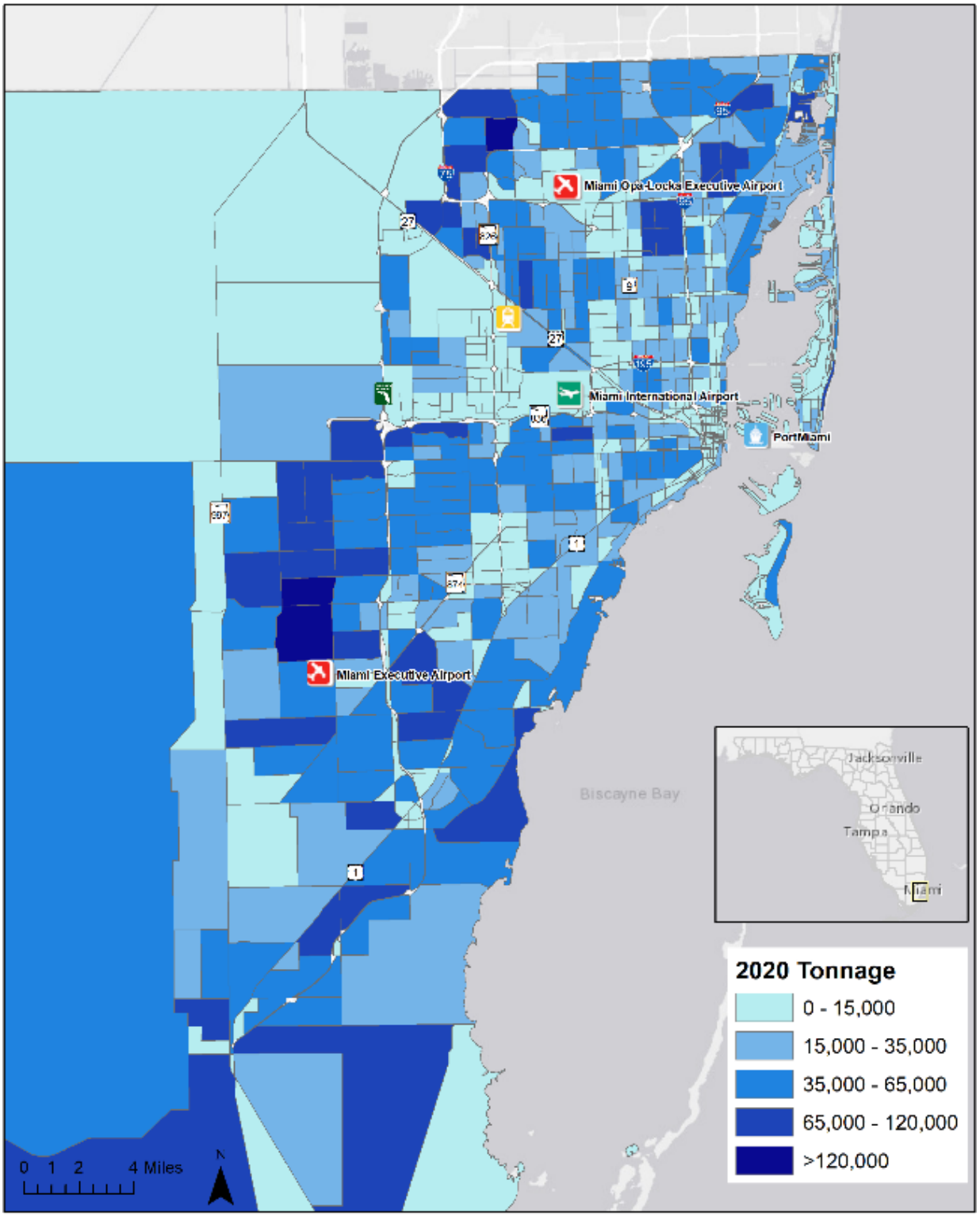
Source: Freight Analysis Framework (FAF), Bureau of Transportation Statistics (BTS)

In Southeast Florida, where the use of roadways is extensive, it becomes crucial to comprehend the reliance of various goods on this infrastructure and their destinations. The Freight Analysis Framework (FAF) 5.0 data from the Bureau of Transportation Statistics (BTS) is used for the analysis as it furnishes comprehensive information on commodity flows, encompassing details such as origin, destination,

commodity type, mode, value, and tonnage. The data was disaggregated to a Traffic Analysis Zone (TAZ) level to depict freight flows accurately.

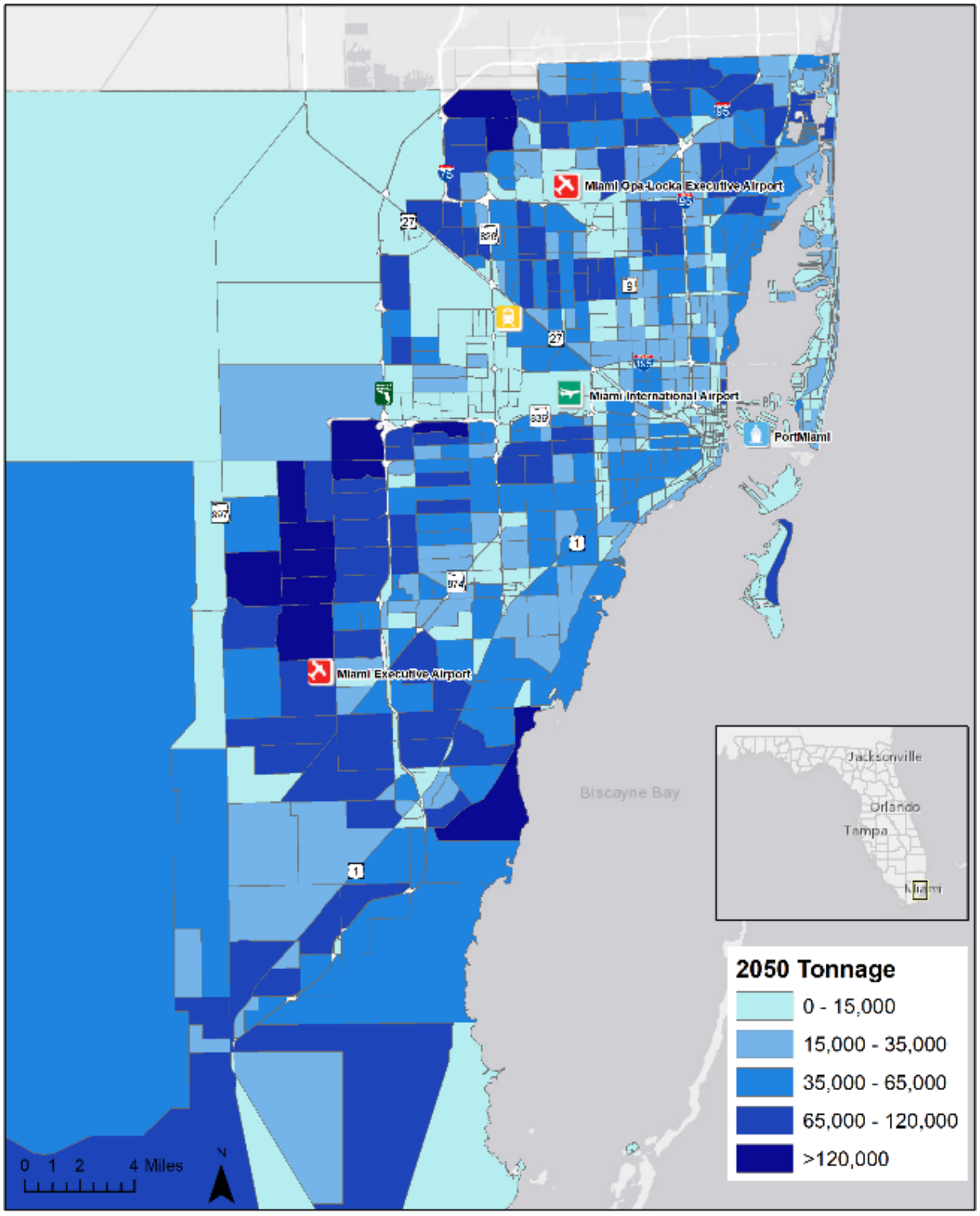
Figure 14 and **Figure 15** show the total commodity tonnage at the TAZ level for 2020 and 2050, respectively. The region is expected to handle more commodities in 2050 compared to 2020 due to the economy and population growth in the future year.

Figure 14. Total Commodity Tonnage by TAZ for the Year 2020



Source: FDOT (September 2023)

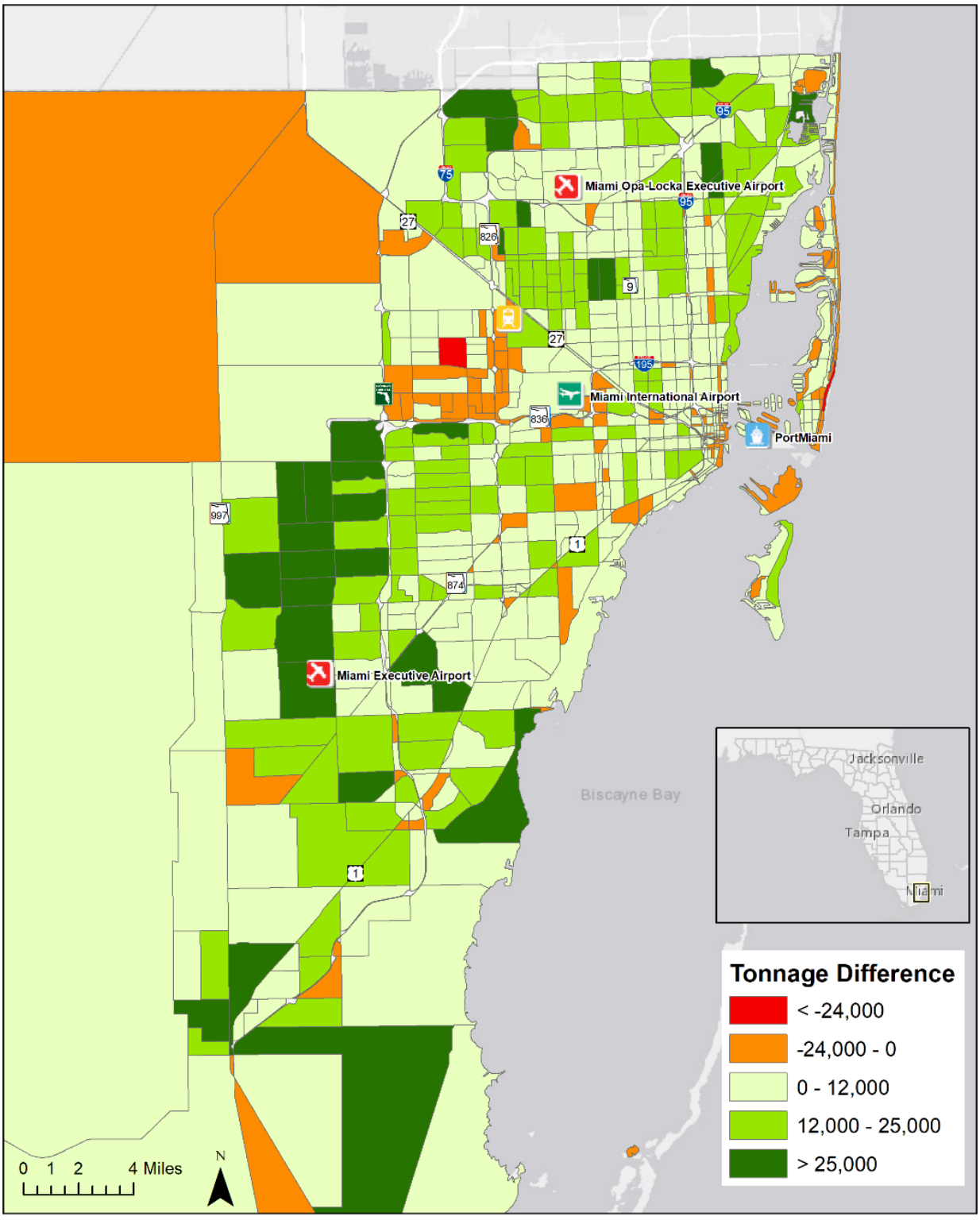
Figure 15. Total Commodity Tonnage by TAZ for the Year 2050



Source: FDOT (September 2023)

Figure 16 presents the difference in commodity tonnage between 2050 and 2020. The most significant increases are observed in Kendall West with its neighboring zones and the northeastern area near County Road 905A/Card Sound Road. Conversely, a large decrease in commodity tonnage is found in the block south of NW 58th Street, from NW 97th Avenue to NW 87th Avenue in the City of Doral. The figure shows a shift in the commodity tonnage from the northwest part to the south part in Miami Dade County will occur.

Figure 16. Difference Between the Year 2020 and 2050 Commodity Tonnage



Source: FDOT (September 2023)

5.0 Global and National Influences and Outlook

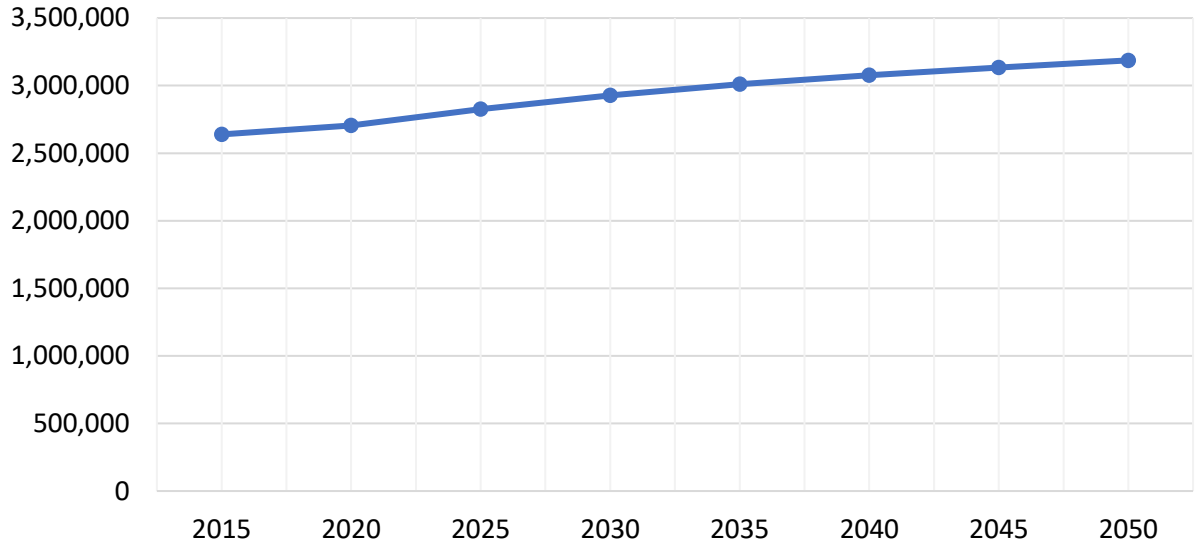
5.1 South Florida Demographics, Land Development, and Investment Trends

DEMOGRAPHICS

Miami-Dade County, known for its dense population, demands a deep understanding of demographic insights and related trends. This comprehension is important for effective future planning and the region's sustainable development.

Figure 17 illustrates the population growth patterns for Miami-Dade County, spanning 2015 to 2050, with data points captured at five-year intervals. The corresponding data is displayed in **Table 2**. The estimated populations for 2015 and 2020 are sourced from the U.S. Census Bureau, while projections from 2025 to 2050 are obtained by the Bureau of Economic and Business Research (BEBR). Both counties demonstrate a consistent and steady increase in population over the specified period.

Figure 17 Population Trend from 2015 to 2050 in District Six



Source: BEBR

Table 2. Population from 2015 to 2050 in Miami-Dade County

Year	Miami-Dade Population
2015	2,639,042
2020	2,705,528
2025	2,826,900
2030	2,928,200
2035	3,010,900
2040	3,076,900
2045	3,133,600
2050	3,186,900

Source: BEBR

Table 3 shows employment trends in Miami-Dade for the model base year 2015 and the horizon year 2045, utilizing information from SERPM 8.533. The table indicates a considerable growth trend, with an increase rate of over 35 percent for total employment.

Table 3. Employment from 2015 to 2045 in Miami-Dade County

	2015	2045	Growth
Total Employment	1,318,040	1813709	37.6%
Manufacturing Production Employment	59,715	71,776	20.2%
Manufacturing Office Support Employment	-	-	-
Wholesale and Warehousing Employment	78,148	105,645	35.2%
Transportation Activity Employment	67,840	83,057	22.4%
Services Employment	725,125	1,049,132	44.7%

Source: BEBR

Table 4 shows household income changes in Miami-Dade for the model base year 2015 and the horizon year 2045, utilizing information from SERPM 8.533. The table indicates that the household income from 25K to 50K will decrease, with the household income from 50K to 75K and greater than 100K increasing in 2045.

Table 4. Household Income Changes from 2015 to 2045 in Miami-Dade County

Year	Income <25K	Income 25K to50K	Income 50K to 75K	Income 75K to 100K	Income >100K
2015	29.2%	25.7%	17.3%	10.1%	17.7%
2045	29.4%	24.3%	17.9%	10.1%	18.2%
Changes (%)	**0.2%**	**-1.4%**	**0.6%**	**0.0%**	**0.5%**

Source: SERPM 8.533

Table 5 shows the changes in the person age group in Miami-Dade for the model base year 2015 and the horizon year 2045, utilizing information from SERPM 8.533. The table indicates that the percentage for the person age group from 0 to 49 will decrease, and the person age group greater than 50 will increase in 2045.

Table 5. Person Age Group Changes from 2015 to 2045 in Miami-Dade County

Year	Age 0 to 17	Age 18 to 24	Age 25 to 34	Age 35 to 49	Age 50 to 64	Age 65 to 79	Age >80
2015	21.0%	9.1%	14.7%	21.8%	19.1%	10.3%	4.0%
2045	18.8%	8.0%	12.1%	18.7%	19.2%	16.1%	7.1%
Changes (%)	**-2.1%**	**-1.1%**	**-2.6%**	**-3.2%**	**0.1%**	**5.8%**	**3.1%**

Source: SERPM 8.533

Table 6 shows household size percentage changes in Miami-Dade for the model base year 2015 and the horizon year 2045, utilizing information from SERPM 8.533. The table indicates that the household size will decrease from 2.83 persons per household in 2015 to 2.78 persons per household in 2045.

Table 6. Household Size Changes from 2015 to 2045 in Miami-Dade County

Year	Household 1-person	Household 2-person	Household 3-person	Household >=4-person	Average Household Size
2015	24.6%	28.3%	18.3%	28.9%	2.83
2045	24.6%	30.4%	17.0%	28.1%	2.78

Source: SERPM 8.533

Land Development

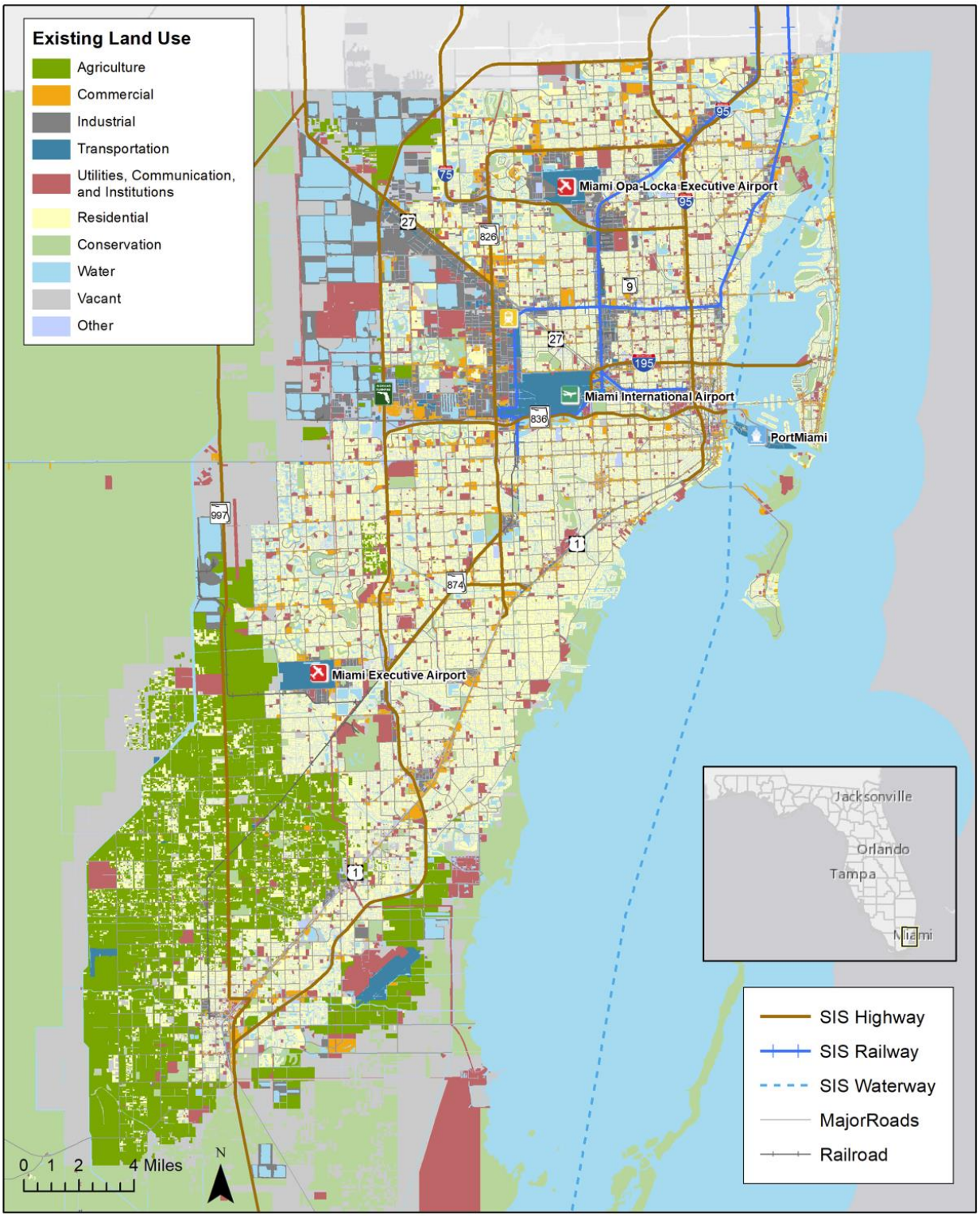
Figure 18 and **Figure 19** present the existing (2015) and future (2040) land use for Miami-Dade County, respectively. The existing land use data is updated weekly based on the latest development and environmental information, while future land use represents the Comprehensive Development Master Plan (CDMP) Land Use Plan for 2045. Source layers are obtained from the Miami-Dade Open Data Hub.

The land use data have been categorized in both figures to help understand the location of freight and industrial operations. Three categories of land use data are considered as significant for freight activity and are listed below:

- **Agriculture**: Land uses include farms, packing facilities, etc. Agricultural activities are notably concentrated in the mid-southern region.
- **Industrial**: Land uses include mining, heavy-light manufacturing, warehousing, distribution centers, etc. The area surrounding the southern and northwest boundaries of the SR-826 and US-27 corridors is characterized by pronounced industrial intensity, with a particular emphasis on freight-related activities. This strategic location facilitates efficient cargo handling and distribution.
- **Transportation**: Land uses include airports, seaports, railroads, and rail terminals. Moreover, SIS corridors and major roadways traverse densely populated areas, primarily serving residential, institutional, and commercial purposes while supporting freight flow within the transportation network.

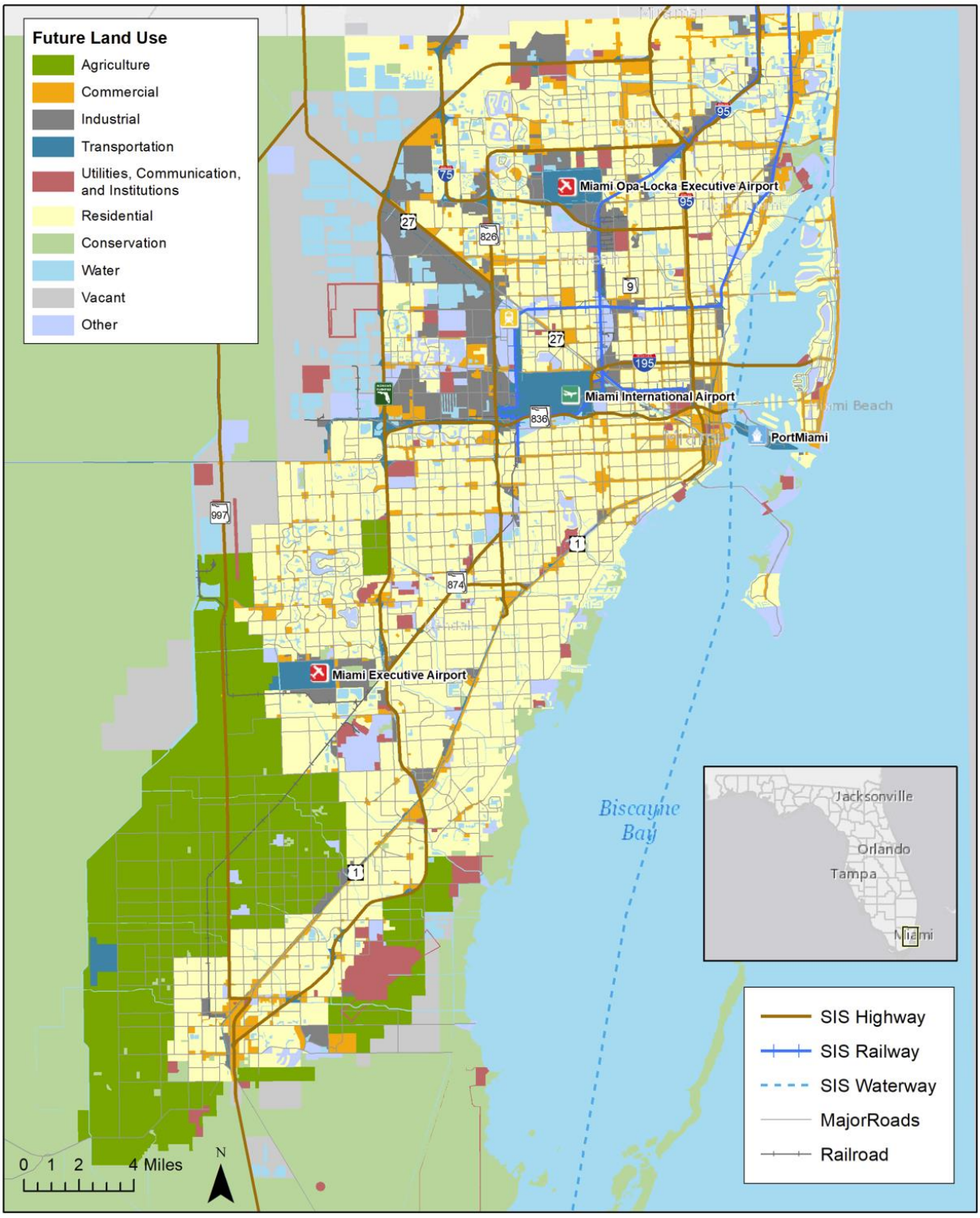
A significant conservation area in the County's western region prevails, comprising the Everglades National Park and other nature preserves and protected zones.

Figure 18. Miami-Dade County Existing Land Use



Source: FDOT, Miami-Dade County (September 2023)

Figure 19. Miami-Dade County Future Land Use



Source: FDOT, Miami-Dade County (September 2023)

5.2 Evolving Freight Supply Chain and Distribution Strategies

The freight and logistics landscape in Miami-Dade County is undergoing a significant transformation driven by technological advancements, shifts in global trade patterns, and changing consumer demands. As a critical hub for international commerce, the region is at the forefront of adopting innovative distribution strategies that enhance efficiency and responsiveness in the supply chain.

Technological Integration

In Miami-Dade County, technological integration, such as advanced tracking systems, real-time data analytics, automated warehouses and robotic systems, and AI-driven predictive modeling, will likely revolutionize freight distribution, optimizing the movement of goods through innovative solutions. These technologies will improve operational agility and cost-effective freight distribution, driving productivity and competitiveness.

E-Commerce Growth

In recent years, Miami has experienced significant growth in the e-commerce industry, leading to the rapid growth of regional fulfillment centers. With its strategic location and thriving business environment, Miami has become a hotbed for online retailers looking to streamline their supply chain operations.

Sustainability Practices

To protect the environment, improve quality of life, and promote sustainable development, Miami-Dade County has implemented the Sustainable Buildings Program. The Sustainable Buildings Program was established to provide consistent direction to county departments and agencies and call for integrating materials and methods that promote environmental quality, economic vitality, and social benefit through best practices in the County's built environment design, construction, and operation.

Global Trade Adjustments

In Miami-Dade County, global trade adjustments have a significant impact due to its strategic location as a gateway to Latin America and the Caribbean. The County serves as a vital hub for international trade, with the Port of Miami being one of the busiest ports in the United States. Changes in tariffs and trade policies will profoundly influence the local economy and employment landscape. Miami-Dade County's diverse business community remains adaptable to these adjustments, leveraging its strengths in logistics, finance, and multicultural expertise for global trade changes.

6.0 Federal Trade Partner Profiles

Federal trade partners are integral to the operations and regulation of the freight network across the U.S.:

- **U.S. Customs and Border Protection (CBP)**: Ensures secure and efficient border crossings for goods, significantly impacting international trade flows by managing customs and immigration enforcement.
- **U.S. Department of Agriculture (USDA)**: Oversees the safety and regulation of agricultural commodities, affecting both imports and domestic products through inspection and quarantine measures.
- **Transportation Security Administration (TSA)**: Extends its security measures to cargo transported by air, ensuring compliance with national security directives and impacting how air cargo is handled and transported.
- **U.S. Fish and Wildlife Service (USFWS)**: Enforces regulations on the transportation of wildlife and related products, crucial for protecting biodiversity and preventing illegal wildlife trafficking.

Understanding the functions and regulations imposed by these agencies provides clear insights into the logistics and regulatory environment influencing freight movements.

6.1 U.S. Customs and Border Protection

CBP is critical in managing the security and facilitation of international trade through U.S. borders, playing a key role in ensuring the efficiency of freight movements. This is particularly crucial in regions with high international trade volumes, such as major port cities and border towns. CBP's responsibilities extend beyond mere inspection of goods entering the country; the agency also collects customs duties and enforces a wide range of U.S. regulations covering trade, customs, and immigration.[2]

CBP uses advanced technology and strategic intelligence to screen and process millions of cargo shipments entering the country each year, aiming to prevent illegal activities while facilitating legitimate trade. This dual role requires CBP officers to be highly skilled in identifying potential threats without impeding the flow of commerce. For instance, at ports of entry, CBP employs sophisticated scanning equipment to check for contraband or unauthorized substances within shipments, ensuring compliance with U.S. laws and international agreements.

In addition to safeguarding the country's borders, CBP plays a significant role in enforcing trade laws that protect the U.S. economy and consumers from counterfeit and unsafe products. This includes upholding intellectual property rights by seizing pirated and counterfeit goods that infringe on trademarks and copyrights. The agency's efforts not only maintain the integrity of the U.S. market but also support domestic industries by preventing the entry of unfairly traded goods.[3]

CBP also oversees the administration of Foreign-Trade Zones (FTZs). In these special areas, domestic and foreign commercial merchandise receives the same Customs treatment as it would if it were outside the commerce of the U.S. These zones are designed to facilitate rapid and efficient international trade with less regulatory oversight, providing significant cost savings and logistical benefits to businesses. Within

[2] For more information, please visit https://www.cbp.gov/border-security.
[3] For more information, please visit https://www.cbp.gov/trade.

these zones, CBP allows for the storage, exhibition, assembly, manufacturing, and processing of goods without immediate imposition of customs duties. By deferring, reducing, or eliminating customs duties, FTZs support domestic economic activity and promote American competitiveness by encouraging companies to maintain and expand their operations in the U.S.[4] The following FTZs are located in Miami-Dade County:[5]

1. **FTZ 32 - MIAMI:** Centered around Miami International Airport, FTZ 32 is a crucial hub for international air freight. It supports a broad range of activities, including pharmaceutical distribution, electronics, and perishable goods, and benefits from rapid customs clearance close to major air transportation routes.
2. **FTZ 166 - HOMESTEAD:** This zone is advantageous for companies seeking operational space outside the more congested Miami metropolitan area. FTZ 166 is primarily focused on light manufacturing, warehousing, and distribution, offering significant logistical benefits due to its proximity to southern parts of Miami-Dade County and the Florida Keys.
3. **FTZ 180 – MIAMI (WYNWOOD):** FTZ 180 is strategically located in the Wynwood area of Miami, known for its vibrant arts district and dynamic commercial growth. This area in Wynwood is ideal for creative, fashion, and technology industries due to its central location in Miami-Dade County, proximity to urban markets, and thriving local economy.
4. **FTZ 281 – MIAMI-DADE COUNTY:** This extensive zone covers several locations, including PortMiami, one of the largest ports in the U.S., and multiple other sites throughout Miami-Dade County. FTZ 281 supports a diverse range of operations, from automobile processing to luxury goods and textile manufacturing. It is designed to maximize economic benefits by leveraging its strategic position from seaport to airport, enhancing the efficiency of global supply chains.

Overall, the activities of CBP are essential for maintaining the security of the U.S. supply chain and the smooth operation of global trade networks, which are crucial to the economy's health. This becomes even more apparent in logistic hubs such as South Florida, where the confluence of air, sea, and land transportation necessitates robust customs operations to handle the diverse and voluminous freight traffic efficiently.

6.2 U.S. Department of Agriculture

The USDA is instrumental in overseeing the safety and compliance of food products entering and circulating within the U.S. This responsibility is crucial in managing risks associated with agricultural imports, which can introduce foreign pests and diseases threatening domestic agriculture and biodiversity. The USDA employs rigorous inspection protocols at points of entry to ensure that agricultural goods, including fruits, vegetables, and meat products, meet established safety standards before they reach the consumer market.[6]

[4] For more information, please visit https://www.cbp.gov/border-security/ports-entry/cargo-security/cargo-control/foreign-trade-zones/about.
[5] To view a map of all FTZs in Florida, please visit https://selectflorida.org/wp-content/uploads/Foreign-Trade-Zones.pdf
[6] For more information, please visit https://www.aphis.usda.gov/.

Moreover, the USDA's quarantine processes are vital in containing and managing biosecurity threats. These processes are designed to isolate and treat any imported agricultural goods suspected of harboring harmful pests or pathogens. By preventing the spread of these threats, the USDA helps protect the country's agricultural resources and supports the stability of food supply chains.

In addition to regulatory enforcement, the USDA provides guidance and support to importers and domestic producers on best practices for managing crop health and ensuring food safety. This comprehensive approach not only safeguards public health but also bolsters the economic stability of the agricultural sector by maintaining consumer confidence in the safety and quality of food products.

6.3 Transportation Security Administration

Primarily known for its role in aviation security, TSA extends its oversight to air freight, ensuring that cargo transported via commercial airlines adheres to stringent security standards. This oversight is critical in safeguarding against threats to the cargo and the broader transportation network. TSA's regulatory framework mandates thorough screening processes for all air cargo, including physical inspections and advanced screening technologies. These measures are designed to detect and prevent the transportation of prohibited items, such as explosives or hazardous materials.

In addition to security screenings, TSA also requires air cargo carriers to implement robust security practices throughout their operations. This includes securing access to cargo areas, vetting employees, and securing cargo from tampering during transit. By setting these standards, TSA plays a vital role in maintaining the integrity of the air cargo supply chain, thus supporting the smooth flow of commerce and bolstering national security.[7]

6.4 U.S. Fish and Wildlife Service

The USFWS is involved in the freight network to the extent that it oversees the transportation of wildlife and wildlife products across borders, ensuring that such activities adhere to national and international conservation laws. This responsibility is essential for protecting species that may be threatened or endangered and for maintaining ecological balance. The USFWS enforces several key regulations, including the *Lacey Act* and the *Endangered Species Act*, which prohibit the trafficking of illegal wildlife products and mandate specific procedures for the legal transport of wildlife.

To effectively manage and monitor these regulations, the USFWS collaborates with other federal agencies, such as CBP, to inspect shipments and enforce compliance at points of entry into the U.S. The agency also works closely with international bodies to align enforcement efforts and strategies, addressing global challenges in wildlife conservation and trafficking.

Additionally, the USFWS issues permits for the legal transport of endangered species and other wildlife, ensuring that such movements do not threaten the survival of the species in the wild.[8] These permits are critical tools in the agency's effort to oversee the conservation and management of wildlife populations, providing a mechanism to track and regulate the impact of human activities on vulnerable species.[9]

[7] For more information, please visit https://www.tsa.gov/for-industry.
[8] For more information, please visit https://www.fws.gov/program/endangered-species.
[9] For more information, please visit https://fwsepermits.servicenowservices.com/fws.

In South Florida, this oversight is particularly significant due to the region's rich biodiversity and unique ecosystems, such as the Everglades, which are home to numerous endangered and exotic species requiring rigorous protection measures.

7.0 Summary of Challenges and Opportunities

Challenges

- **Traffic Congestion and Efficiency**: In Miami-Dade County, the existing and projected AADT indicates substantial traffic congestion, especially during peak hours on key corridors such as I-95, SR-826, and SR-836. These congestion levels significantly affect the efficiency of transportation and logistics operations, leading to delays that can disrupt the supply chain. To mitigate these challenges, businesses must plan their logistics operations carefully and explore innovative solutions such as off-peak freight delivery times or advanced traffic management technologies that optimize route planning in real time.
- **Freight Capacity and Infrastructure Demands**: As highlighted in the freight network statistics, truck volumes and percentages are projected to increase significantly by 2045, placing additional pressure on the existing infrastructure. This requires strategic planning to enhance capacity and efficiency, including the consideration of investments in infrastructure upgrades or expansions, particularly on corridors that show the highest growth in freight volumes.

Opportunities

- **E-commerce and Distribution Hub Development**: The rapid growth of E-commerce has transformed the logistics industry. With its robust infrastructure and strategic location as a gateway between the Americas and the broader global market, Miami-Dade County is well-positioned to continue growing as a premier distribution hub. This is further supported by the County's ongoing advancements in technology integration and sustainable practices in the freight and logistics sectors. Businesses can leverage this position by investing in regional fulfillment centers and adopting new technologies that streamline warehouse operations and distribution processes.
- **Technological Advancements in Freight Logistics**: With the evolution of freight supply chain and distribution strategies, there is a significant opportunity to implement advanced technological solutions such as AI-driven logistics management, blockchain for supply chain transparency, and automated freight systems. These technologies can enhance operational efficiencies, reduce costs, and improve service reliability in the face of growing demand.
- **Sustainability and Urban Planning**: As part of its sustainability initiatives, Miami-Dade County focuses on integrating environmental considerations into its transportation and urban planning efforts. This opens opportunities for businesses to engage in sustainable practices, such as using alternative fuel vehicles and participating in urban freight consolidation programs, aligning with the County's goals for environmental stewardship and economic vitality.